



Forest Insect & Disease Management

Damage Appraisal
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DAMAGE APPRAISAL OF HORNED OAK GALL ON PIN OAK IN OAKWOOD BOTTOMS GREENTREE RESERVOIR, SHAWNEE NATIONAL FOREST, 1979

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INTRODUCTION


The Oakwood Bottoms Greentree Reservoir on the Murphysboro Ranger District of the Shawnee National Forest in Illinois is managed for wildlife, recreation, and timber production. Seventy-five percent of the mixed oak stands are flooded during the dormant season (October 1- February 15) and provide a desirable habitat for migrating, wintering, and local waterfowl. Wells are used to flood the various compartments from 6 to 18 inches deep. The remainder of the area stays unflooded each year or is naturally flooded by the Big Muddy River.

Pin oaks, Quercus palustris (Muenchh.), in these stands are particularly important because of the timber value and, more importantly, for the forage, cover, and nesting sites they provide for ducks.

During the summer of 1979, pin oak mortality and its apparent causal agent, the horned oak gall wasp, Callirhytis cornigera (Osten Sacken), were reported to Forest Insect and Disease Management. Shawnee National Forest personnel requested a survey to determine the extent and severity of damage caused by this insect.

The stands supporting horned oak gall infestations have different flooding histories. Some of the compartments have been flooded continuously since 1964 (Areas E, F, G, H and I). Other compartments have only been subjected to intentional flooding since 1977 (Areas B and C). There are also infested stands that have not been flooded at all or only flooded naturally for shorter periods of time (Table 1).

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OBJECTIVE

The objective of the survey was to determine tree condition and the extent and severity of gall damage. A secondary objective was to see if there was a relationship between flooding history and intensity of damage by the horned oak gall.

METHODS

Variable radius plots (BAF = 10) were located in seven compartments that are intentionally flooded and in four compartments that may be naturally flooded by the Big Muddy River. Sampling intensity varied with each compartment; those compartments heavily infested with galls were sampled more intensively. Plots were at least three chains apart and a minimum of two chains from bordering levees or roads.

In each plot, all trees more than 6 inches dbh were recorded as either living or dead and were rated for relative gall intensity, using the following system:

Light--0-25 percent crown infested
Medium--26-75 percent crown infested
Heavy--76-100 percent crown infested

Another category of "risk trees" was recorded; these trees were heavily infested with galls and are not expected to live another year.

RESULTS

All 11 compartments surveyed supported horned oak gall populations and all but one contained dead pin oak (Table 2). Compartments B, C, and D support the heaviest gall infestations and have 22 percent pin oak mortality (Table 3). More than 15 percent of the trees in these areas are considered "risk" trees.

The majority of trees in compartments intentionally flooded since 1964 (Areas E, F, G, H, and I) are moderately infested with galls; however, mortality is less than 10 percent. Naturally flooded compartments J and K also support the infestation, however, more than 70 percent of the affected trees are in the "light" category and tree mortality is less than 3 percent.

DISCUSSION

Little is known about the horned oak gall because the insect is usually not considered to be economically important. We, therefore, cannot pinpoint the cause or causes of an outbreak.

The compartments in the northern portion of the Oakwood Bottoms Greentree Reservoir support the heaviest populations and have the greatest damage. Two of these compartments have been flooded only since 1977, the other is naturally flooded. Horned oak gall infestation levels seem to be unrelated to flooding history or frequency.

RECOMMENDATIONS

Because mortality is expected to be greater than 35 percent in compartments B, C, and D they should be considered for salvage in 1980. We recommend that Forest Insect and Disease Management monitor the remaining compartments in 1980 to gather trend information and determine the condition of the trees.

Table 1.--Acreage of pin oak and other species, and annual flooding treatments by compartment of Oakwood Bottoms Greentree Reservoir, Shawnee National Forest, 1979

Compartment	Treatment ^{a/}	Pin oak Acres	All Species
A	None	549	799
B	1977, 1978	129	129
C	1977, 1978	216	259
D	Irregular	221	225
E	1977, 1978	456	600
F	1964 to 1978	460	460
G	1965 to 1978	441	600
H	1964 to 1978	696	705
I	1964 to 1978	589	598
J	Irregular	40	44
K	Irregular	85	98

^{a/}Flooded October 1 through February 15; irregular flooding caused by overflow of Big Muddy River.

Table 2.--Percentage of pin oaks with and without horned oak gall by tree condition classes in the Oakwood Bottom Greentree Reservoir, Shawnee National Forest, 1979

Compartment ^{a/}	Live trees		Risk trees		Dead trees	
	With	Without	With	Without	With	Without
A (35)	85.5	3.2	4.3	0	7.0	0
B (30)	44.4	0	31.1	0	22.0	2.2
C (31)	55.2	2.0	17.4	1.0	22.4	2.0
D (14)	50.0	3.2	20.2	0	22.3	4.3
E (13)	77.7	4.8	9.5	0	4.8	3.2
F (14)	82.4	5.5	0	0	2.2	9.9
G (14)	87.5	3.7	1.5	1.5	0	5.8
H (12)	79.1	16.3	0	0	0	4.6
I (13)	81.7	4.2	4.2	1.4	8.5	0
J (8)	92.1	5.3	0	0	2.6	0
K (11)	97.2	2.8	0	0	0	0

^{a/}Number of 10 BAF prism points in parentheses.

Table 3.--Percentage of pin oak infested with horned oak gall, by infestation level,^{a/} in Oakwood Bottoms Greentree Reservoir, Shawnee National Forest, 1979

Compartment	Light	Medium	Heavy
A	44.8	34.8	20.4
B	4.6	25.6	69.9
C	12.0	43.5	44.5
D	10.4	42.5	47.1
E	18.9	48.3	32.8
F	61.0	18.2	20.8
G	51.2	36.4	12.4
H	29.4	32.4	38.2
I	26.9	17.9	55.2
J	94.4	6.0	0
K	71.4	25.7	2.9

^{a/}Infestation levels are light, 0 to 25 percent infested; medium, 26 to 75 percent infested; and heavy, 76 to 100 percent infested.